REMARKS

Claims 10-11, 15, 25-26, 30-58, 62, and 66-82 remain pending in the application. Favorable reconsideration is respectfully requested in view of the above amendments and the following remarks.

The allowance of claims 10-11, 25-26, 31-40, 41-58, 62, and 66-72 is again gratefully acknowledged.

Claims 15, 30, and 73-82 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Easton (USP 5,764,687) (henceforth "Easton") in view of Sih et al. (USP 6,608,858) (henceforth, "Sih"). This rejection is respectfully traversed.

As explained in Applicants' specification beginning at page 18, line 17, the problem of how to handle a frequency error between a local frequency reference of a receiver such as a mobile station and the carrier frequency of a transmitter is aggravated if the receiver receives signals from multiple transmitters at the same time, e.g., if a mobile station is communicating with more than one base station simultaneously, as in a soft handover situation. This problem is addressed by handling (e.g., combining) received path rays from different base stations separately. This is useful because, by individually applying the AFC algorithms to each base station, the frequency offset between the mobile station and the base stations can be determined, thereby allowing a decision to be made as to what the final frequency offset should be. See, e.g., Applicants' specification at page 19, lines 9-22.

Independent claims 15, 30, 73, and 75 define embodiments that include this solution to the problem. In particular, claim 15 defines a transceiver that includes, *inter alia*, "frequency error estimators for computing a frequency error estimate for each ray based on successive values of a respective one of the channel estimates; and at least two summers for performing weighted summations of groups of the frequency error estimates to provide at least two combined frequency error estimates, wherein: each of the combined frequency error estimates corresponds to a respectively different one of at least two base station transmitters" (emphasis added).

Independent claim 30 similarly defines a method that includes, *inter alia*, "performing at least two weighted summations of groups of the frequency error estimates to provide at least two combined frequency error estimates, wherein each of the combined frequency error estimates corresponds to a respectively different one of at least two base station transmitters" (emphasis added).

Similarly, independent claim 73 defines an apparatus that comprises, "frequency error estimators for estimating frequency errors separately for different signal paths; and combiners for combining groups of the frequency error estimates to produce at least two combined frequency error estimates, wherein each of the combined frequency error estimates corresponds to a respectively different one of the two or more transmitters" (emphasis added).

Independent claim 75 similarly defines a method that comprises "estimating frequency errors separately for different signal paths; and combining groups of the frequency error estimates to produce at least two combined frequency error estimates, wherein each of the combined frequency error estimates corresponds to a respectively different one of the two or more transmitters" (emphasis added).

The Office acknowledges that Easton fails to disclose at least two summers for performing weighted summations of groups of the frequency error estimates to provide at least two combined frequency error estimates, wherein: each of the combined frequency error estimates corresponds to a respectively different one of at least two base station transmitters. The Office now relies on Sih as making up for these deficiencies.

This reliance is unfounded for at least the following reasons. Sih's arrangement provides a number of Rake fingers 700A-700N, each producing a respective error $e_1(n)$, ..., $e_N(n)$. Each of the error terms is supplied as an input to block 710, which produces therefrom a weighted average error term which, after further processing, is used to control the output frequency of a voltage controlled oscillator 740. Of relevance to this discussion is that *the weighted average is computed across all Rake fingers 700A-700N without regard to what transmitter those frequency error values are associated with; consequently, there is no mechanism for causing the weighted average to be representative of any one base station.*

To correct for frequency error due to Doppler, a respective one of a number of rotators 706A-706N is provided at the input of each finger 700A-700N to first rotate the IQ baseband samples prior to their being supplied to the fingers 700A-700N. The amount of rotation for each Rake finger is separately controlled by circuitry that pairs one of a number of summers 702A-702N with a respective one of a number of loop filters 704A-704N. Each summer 702A-702N subtracts its corresponding one of the error signals $e_1(n)$, ..., $e_N(n)$ from the weighted average. The result is then filtered by the loop filter 704A -704N, and the filtered signal controls the amount of rotation.

At no point in this process does the arrangement of Sih "provide at least two combined frequency error estimates, wherein: each of the combined frequency error estimates

corresponds to a respectively different one of at least two base station transmitters," as variously defined by Applicants' independent claims. Consequently, any combination of Sih with Easton would similarly lack at least this feature, rendering such combination insufficient to support a *prima facie* case of obviousness.

In support of the rejection, the Office argues that "Sih disclose a RAKE receiver [that] comprises ... summers 702A-702N (at least two summers) for performing weighted summations (performing subtracting the frequency error of each finger from the weighted average, respectively, col. 6, lines 35-37) of groups of the frequency error estimates (frequency errors e(n)-e(n), col. 6, lines 35-37) to provide at least two combined frequency error estimates (to provide at least two combined frequency error estimates, each combined frequency error estimate provided by the difference between finger frequency error and the weighted average, col. 6, lines 35-37 and Fig. 7; note that the differences correspond to the combined frequency error estimates), wherein: each of the combined frequency error estimates (each of the difference between finger frequency error and the weighted average, col. 6, lines 35-37 corresponds to a respective different one of at least two base station transmitters (each frequency error corresponds to a different one of at least two base stations, col. 1, lines 56-65, col. 3, lines 14-62 and Fig. 4)."

The Office is understood to argue, then, that each of Sih's summers 702A-702N generates Applicants' claimed "combined frequency error estimates, wherein: each of the combined frequency error estimates corresponds to a respectively different one of at least two base station transmitters." However, this argument is technically flawed for the reasons expressed earlier: If the Rake fingers 700A-700N are variously associated with different base stations, the corresponding weighted average is not representative of any one of them. Consequently, subtracting one of the error signals $e_1(n)$, ..., $e_1(n)$ from this weighted average does not cause the result to be associated with "a respectively different one of at least two base station transmitters", as required by Applicants' claims. To take an example, suppose N=4, and each of the fingers 700A-700N is associated with a different base station. The weighted average generated by block 710 would, in this case, be an average computed over all four base stations. The first of the summers (i.e., summer 702A) then operates to subtract out the error signal associated with the first base station (i.e., error signal $e_1(n)$) from the weighted average, but the result of this subtraction merely represents the amount by which the error associated with the first base station (i.e., $e_1(n)$) differs from the weighted average computed over all four base stations. The remaining three summers 702B-702(N) generate

similar results. Nothing in Sih's arrangement causes this or any other signal to represent a combined frequency error estimate that is associated with one of the base stations.

A key point in this regard is that *different paths from the same base station will have different Doppler shifts*. For this reason, Applicants' claimed embodiments combine frequency errors from *different paths of the same base station* to average out the Doppler shift due to path orientation so that the offset due to the transmitter remains. The prior art of record fails to disclose or suggest this, and therefore cannot support a *prima facie* case of obviousness against Applicants' claimed embodiments.

In view of the foregoing, it is respectfully asserted that each of the independent claims 15, 30, 73, and 75, as well as their related dependent claims 74 and 76-82 are patentably distinguishable over the prior art of record. Accordingly, it is respectfully requested that the rejection of claims 15, 30, and 73-82 under 35 U.S.C. §103(a) be withdrawn.

The application is believed to be in condition for allowance. Prompt notice of same is respectfully requested.

Respectfully submitted,

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